

S8.3.9 *Wind velocity.* The average ambient wind velocity at the CNG fuel container during the period specified in S8.3.6 of this standard is not to exceed 2.24 meters/second (5 mph).

S8.3.10 The average wind velocity at the container is any velocity up to and including 2.24 meters/second (5 mph).

[59 FR 49021, Sept. 26, 1994; 59 FR 66776, Dec. 28, 1994; 60 FR 37843, July 24, 1995; 60 FR 57948, Nov. 24, 1995; 61 FR 19204, May 1, 1996; 61 FR 47089, Sept. 6, 1996; 63 FR 66765, Dec. 3, 1998; 65 FR 51772, Aug. 25, 2000; 65 FR 64626, Oct. 30, 2000]

§ 571.305 Standard No. 305; Electric-powered vehicles: electrolyte spillage and electrical shock protection.

S1. *Scope.* This standard specifies requirements for limitation of electrolyte spillage, retention of propulsion batteries during a crash, and electrical isolation of the chassis from the high-voltage system, to be met by vehicles that use electricity as propulsion power.

S2. *Purpose.* The purpose of this standard is to reduce deaths and injuries during a crash which occur because of electrolyte spillage from propulsion batteries, intrusion of propulsion battery system components into the occupant compartment, and electrical shock.

S3. *Application.* This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks and buses with a GVWR of 4536 kg or less, that use more than 48 nominal volts of electricity as propulsion power and whose speed attainable in 1.6 km on a paved level surface is more than 40 km/h.

S4. Definition.

Battery system component means any part of a battery module, interconnect, venting system, battery restraint device, and battery box or container which holds the individual battery modules.

Dummy means a 50th percentile male test dummy as specified in subpart F of part 572 of this chapter.

S5. *General requirements.* Each vehicle to which this standard applies, when tested according to S6 under the conditions of S7, must meet the requirements of S5.1, S5.2, and S5.3.

S5.1 *Electrolyte spillage from propulsion batteries.* Not more than 5.0 liters of

electrolyte from propulsion batteries shall spill outside the passenger compartment, and no visible trace of electrolyte shall spill into the passenger compartment. Spillage is measured from the time the vehicle ceases motion after a barrier impact test until 30 minutes thereafter, and throughout any static rollover after a barrier impact test.

S5.2 *Battery Retention.* Battery modules located inside the passenger compartment must remain in the location in which they are installed. No part of any battery system component that is located outside the passenger compartment shall enter the passenger compartment during the test procedures of S6 of this standard, as determined by visual inspection.

S5.3 *Electrical isolation.* Electrical isolation between the battery system and the vehicle electricity-conducting structure after each test must be not less than 500 ohms/volt.

S6. *Test requirements.* Each vehicle to which this standard applies, under the conditions of S7, must be capable of meeting the requirements of any applicable single barrier crash/static rollover test sequence, without alteration of the vehicle during the test sequence. A particular vehicle need not meet further test requirements after having been subjected to a single barrier crash/static rollover test sequence.

S6.1 *Frontal barrier crash.* The vehicle must meet the requirements of S5.1, S5.2 and S5.3 when it is traveling longitudinally forward at any speed, up to and including 48 km/h, and impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle.

S6.2 *Rear moving barrier impact.* The vehicle must meet the requirements of S5.1, S5.2, and S5.3, when:

(a) it is impacted from the rear by a barrier moving at any speed up to and including 48 km/h, with a dummy at each front outboard designated seating position, or

(b) at the manufacturer's option (with said option irrevocably selected prior to, or at the time of, certification of the vehicle), it is impacted at 80 ± 1.0

km/h with 50th percentile test dummies as specified in part 572 of this chapter at each front outboard designated seating position under the conditions specified in S7.3(b) of FMVSS No. 301 and S7 of this section as applicable.

S6.3 Side moving deformable barrier impact. The vehicle must meet the requirements of S5.1, S5.2, and S5.3 when it is impacted from the side by a barrier that conforms to part 587 of this chapter that is moving at any speed up to and including 54 km/h, with dummies positioned in accordance with S7 of Sec. 571.214 of this chapter.

S6.4 Post-impact test static rollover. The vehicle must meet the requirements of S5.1, S5.2, and S5.3, after being rotated on its longitudinal axis to each successive increment of 90 degrees after each impact test specified in S6.1, S6.2, and S6.3.

S7. Test conditions. When the vehicle is tested according to S6, the requirements of S5 must be met under the conditions in S7.1 through S7.6.7. Where a range is specified, the vehicle must be capable of meeting the requirements at all points within the range.

S7.1 Battery state of charge. The battery system is at the level specified in the following paragraph (a), (b), or (c), as appropriate:

(a) At the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently affixed to the vehicle;

(b) If the manufacturer has made no recommendation, at a state of charge of not less than 95 percent of the maximum capacity of the battery system; or

(c) If the batteries are rechargeable only by an energy source on the vehicle, at any state of charge within the normal operating voltage, as defined by the vehicle manufacturer.

S7.2 Vehicle conditions. The switch or device that provides power from the propulsion batteries to the propulsion motor(s) is in the activated position or the ready-to-drive position.

S7.2.1 The parking brake is disengaged and the transmission, if any, is in the neutral position. In a test con-

ducted under S6.3, the parking brake is set.

S7.2.2 Tires are inflated to the manufacturer's specifications.

S7.2.3 The vehicle, including test devices and instrumentation, is loaded as follows:

(a) A passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the necessary test dummies as specified in S6, restrained only by means that are installed in the vehicle for protection at its seating position.

(b) A multipurpose passenger vehicle, truck, or bus with a GVWR of 4536 kg or less is loaded to its unloaded vehicle weight plus the necessary dummies, as specified in S6, plus 136 kg or its rated cargo and luggage capacity weight, whichever is less. Each dummy is restrained only by means that are installed in the vehicle for protection at its seating position.

S7.3 Static rollover test conditions. In addition to the conditions of S7.1 and S7.2, the conditions of S7.4 of Sec. 571.301 of this chapter apply to the conduct of static rollover tests specified in S6.4.

S7.4 Rear moving barrier impact test conditions. In addition to the conditions of S7.1 and S7.2, the rear moving barrier test conditions for S6.2(a) are those specified in S8.2 of Standard No. 208 (49 CFR 571.208), except for the positioning of the barrier and the vehicle. The rear moving barrier is described in S8.2 of Standard No. 208 of this chapter. The barrier and test vehicle are positioned so that at impact—

(a) The vehicle is at rest in its normal attitude;

(b) The barrier is traveling at 48 km/h with its face perpendicular to the longitudinal centerline of the vehicle; and

(c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface coincides with the longitudinal centerline of the vehicle.

S7.5 Side moving deformable barrier impact test conditions. In addition to the conditions of S7.1 and S7.2, the conditions of S6.10, S6.11, and S6.12 of Sec.

571.214 of this chapter apply to the conduct of the side moving deformable barrier impact test specified in S6.3.

S7.6 Electrical isolation test procedure. In addition to the conditions of S7.1 and S7.2, the conditions in S7.6.1 through S7.6.7 apply to the measurement of electrical isolation specified in S5.3.

S7.6.1 Prior to any barrier impact test, the propulsion battery system is connected to the vehicle's propulsion system, and the vehicle ignition is in the "on" (traction (propulsion) system energized) position. If the vehicle utilizes an automatic disconnect between the propulsion battery system and the traction system that is physically contained within the battery pack system, the electrical isolation measurement after the impact is made from the traction side of the automatic disconnect to the vehicle chassis. If the vehicle utilizes an automatic disconnect that is not physically contained within the battery pack system, the electrical isolation measurement after the impact is made from the battery side of the automatic disconnect to the vehicle chassis.

S7.6.2 The voltmeter used in this test measures direct current values and has an internal resistance of at least 10 MΩ.

S7.6.3 The voltage is measured as shown in Figure 1 and the propulsion battery voltage (V_b) is recorded. Before any vehicle impact test, V_b is equal to or greater than the nominal operating voltage as specified by the vehicle manufacturer.

S7.6.4 The voltage is measured as shown in Figure 2, and the voltage (V_1) between the negative side of the propulsion battery and the vehicle chassis is recorded.

S7.6.5 The voltage is measured as shown in Figure 3, and the voltage (V_2) between the positive side of the propulsion battery and the vehicle chassis is recorded.

S7.6.6 If V_1 is greater than or equal to V_2 , insert a known resistance (R_o) between the negative side of the propulsion battery and the vehicle chassis. With the R_o installed, measure the voltage (V_1') as shown in Figure 4 between the negative side of the propulsion battery and the vehicle chassis. Calculate the electrical isolation (R_i) according to the formula shown. This electrical isolation value (in ohms) divided by the nominal operating voltage of the propulsion battery (in volts) must be equal to or greater than 500.

S7.6.7 If V_2 is greater than V_1 , insert a known resistance (R_o) between the positive side of the propulsion battery and the vehicle chassis. With the R_o installed, measure the voltage and record the voltage (V_2') between the positive side of the propulsion battery and the vehicle chassis as shown in Figure 5. Calculate the electrical isolation (R_i) according to the formula shown. This electrical isolation value (in ohms) divided by the nominal operating voltage of the propulsion battery (in volts) must be equal to or greater than 500.

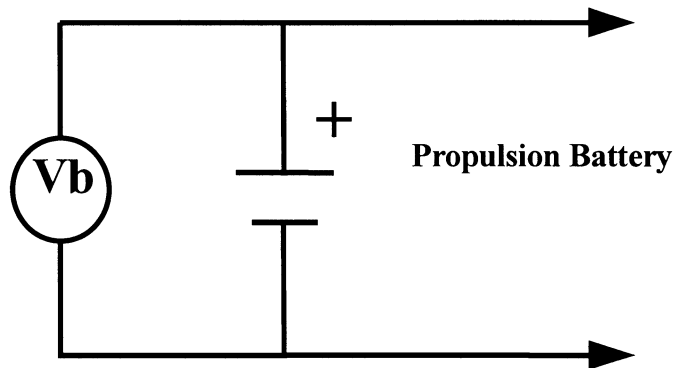


Figure 1. S7.6.3 Measurement Location For Vb Voltage

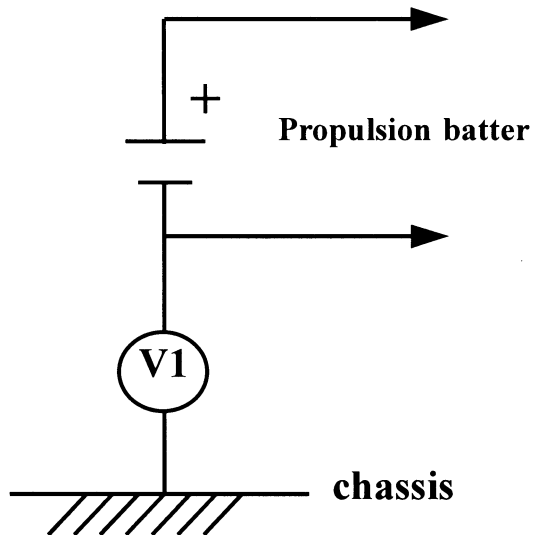


Figure 2. S7.6.4 Measurement Location For V1 Voltage

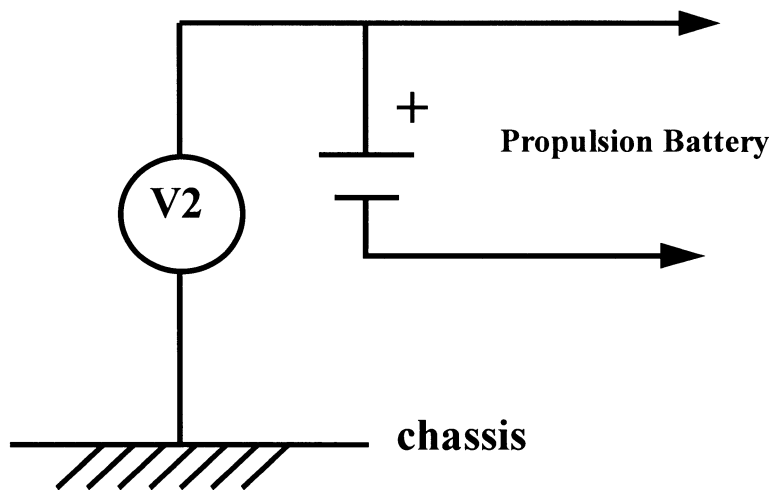


Figure 3. S7.6.5 Measurement Location For V2 Voltage

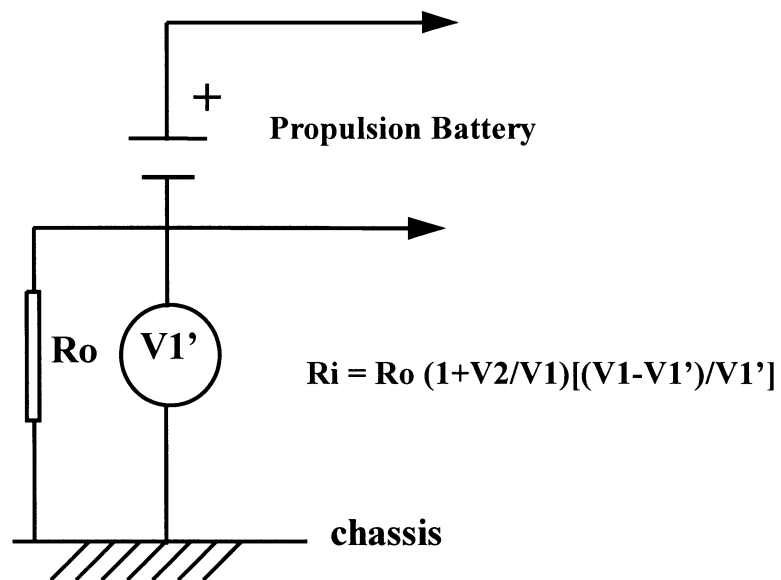


Figure 4. S7.6.6 Measurement Location For V1' Voltage

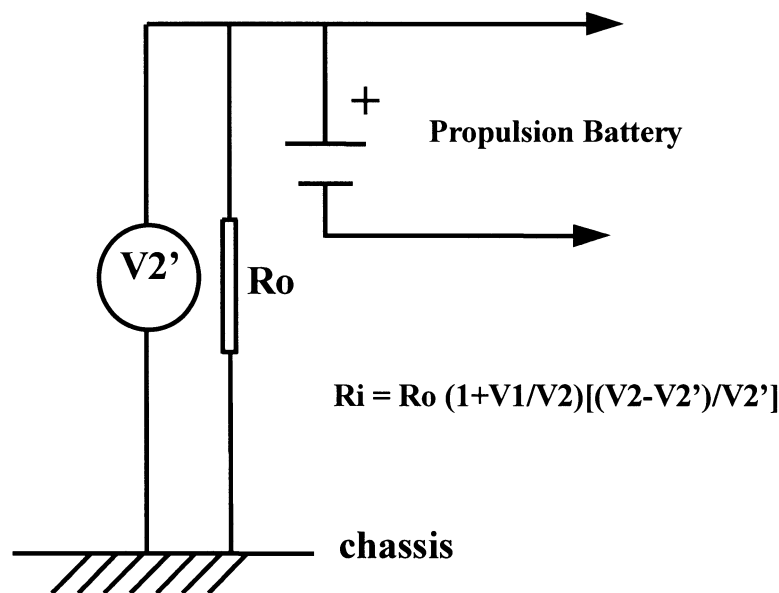


Figure 5. S7.6.7 Measurement Location For V2' Voltage

[65 FR 57988, Sept. 27, 2000, as amended at 66 FR 60160, Dec. 3, 2001; 69 FR 51399, Aug. 19, 2004]

EFFECTIVE DATE NOTE: At 72 FR 51972, Sept. 11, 2007, §571.305 was amended by revising S6.3 and S7.5, effective Nov. 13, 2007. For the convenience of the user, the added and revised text is set forth as follows:

§ 571.305 Standard No. 305; Electric-powered vehicles; electrolyte spillage and electrical shock protection.

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S6.3 Side moving deformable barrier impact. The vehicle must meet the requirements of S5.1, S5.2, and S5.3 when it is impacted from the side by a barrier that conforms to part 587 of this chapter that is moving at any speed up to and including 54 km/h, with 49 CFR part 572, subpart F test dummies positioned in accordance with S7 of Sec. 571.214 of this chapter.

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S7.5 Side moving deformable barrier impact test conditions. In addition to the conditions of S7.1 and S7.2, the conditions of S8 of Sec.

571.214 of this chapter apply to the conduct of the side moving deformable barrier impact test specified in S6.3.

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§ 571.401 Standard No. 401; Interior trunk release.

S1. Purpose and scope. This standard establishes the requirement for providing a trunk release mechanism that makes it possible for a person trapped inside the trunk compartment of a passenger car to escape from the compartment.

S2. Application. This standard applies to passenger cars that have a trunk compartment. This standard does not apply to passenger cars with a back door.

S3. Definitions.

Back door means a door or door system on the back end of a passenger car through which cargo can be loaded or